

The listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claims 1-83 cancelled.

84. (currently amended) A method for facilitating communications between a network node and a Head End of an access network, the access network including a plurality of nodes which communicate with the Head End via at least one upstream channel and at least one downstream channel, the access network including a first node adapted to communicate with the Head End via at least one downstream channel and at least one upstream channel, the access network further including a second node adapted to communicate with the Head End via at least one downstream channel and at least one upstream channel, the at least one downstream channel including a first downstream channel and a second downstream channel, wherein the first downstream channel is associated with a first channel identifier, and the second downstream channel is associated with a second channel identifier, the at least one upstream channel including a first upstream channel associated with a third channel identifier, wherein the third channel identifier is different from the first channel identifier and second channel identifier, the method comprising:

communicating between the Head End and the first and second nodes via the first downstream channel;

monitoring bandwidth-related information associated with the first and second downstream channels;

performing a load balancing operation which includes transmitting a dynamic channel change request to the first node in order to cause the first node to switch from the first downstream channel to the second downstream channel, wherein the load balancing operation is performed for the purpose of managing bandwidth resources on the first and second downstream channels;

receiving, at the first node, a first communication from the Head End, said first communication including the request to perform a dynamic channel change operation, said dynamic channel change (DCC) request including a request to perform a downstream channel change operation;

responding to the dynamic channel change request by implementing the downstream channel change operation at the first node;

communicating between the Head End and the first node via the second downstream channel after successful completion of the downstream channel change operation; and

communicating between the Head End and the second node via the first downstream channel after successful completion of the downstream channel change operation at the first node.

85. (previously presented) The method of claim 84 wherein the first downstream channel has associated therewith a first frequency, and wherein the second downstream channel has associated therewith a second frequency, the method further comprising:

maintaining the first and second frequencies associated with the first and second downstream channels during the implementing of the downstream channel change operation at the first node.

86. (previously presented) The method of claim 84 further comprising performing a load balancing operation which includes transmitting the dynamic channel change request to the first node in order to cause the first node to switch from the first downstream channel to the second downstream channel.

87. (cancelled)

88. (previously presented) The method of claim 84 wherein implementing the dynamic channel change operation comprises switching from the first downstream channel to the second downstream channel to receive communications from the Head End.

89. (previously presented) The method of claim 84 further comprising communicating with the Head End using data received on the first downstream channel prior to performing the dynamic channel change operation.

90. (previously presented) The method of claim 88 wherein implementing the dynamic channel change operation further comprises determining whether said second downstream channel is currently being used for receiving communications from the Head End.

91. (previously presented) The method of claim 88 further comprising transmitting a dynamic channel change response to the Head End in response to receiving the dynamic channel change request.

92. (previously presented) The method of claim 84, wherein the method further comprises:

determining whether data transmitted at the Head End is successfully received on the second downstream channel; and

switching from the second downstream channel to the first downstream channel in response to a determination that data transmitted at the Head End can not be successfully received on the second downstream channel.

93. (previously presented) The method of claim 84 wherein said access network is a wireless network.

94. (previously presented) The method of claim 84 wherein said access network is a cable network, said plurality of nodes are cable modems, and wherein said Head End comprises a Cable Modem Termination System (CMTS).

95. (previously presented) The method of claim 84 further comprising:  
receiving a request from the Head End to switch from the first upstream channel to a second upstream channel; and

switching to said second upstream channel and said second downstream channel at substantially the same time.

96. (previously presented) The method of claim 95 further comprising:  
switching from the first upstream channel to a second upstream channel for transmitting data to the Head End; and

switching from the first downstream channel to the second downstream channel for receiving data from the Head End.

97. (previously presented) The method of claim 95 wherein the switching of the upstream and downstream channels results in a switching between a first domain and a second domain of the access network.

98. (previously presented) The method of claim 97 further comprising initiating a domain registration procedure after successfully switching the upstream and downstream channels.

99. (previously presented) The method of claim 98 further comprising initiating a ranging procedure after successfully switching the upstream and downstream channels.

100. (previously presented) The method of claim 95 wherein the first and second downstream channels are not in synchronization.

101. (currently amended) A system for facilitating communications between a network node and a Head End of an access network, the access network including a plurality of nodes which communicate with the Head End via at least one upstream channel and at least one downstream channel, the access network including a first node adapted to communicate with the Head End via at least one downstream channel and at least one upstream channel, the access network further including a second node adapted to communicate with the Head End via at least one downstream channel and at least one upstream channel, the at least one downstream channel including a first downstream channel and a second downstream channel, wherein the first downstream channel is associated with a first channel identifier, and the second downstream channel is associated with a second channel identifier, the at least one upstream channel including a first upstream channel associated with a third channel identifier, wherein the third channel identifier is different from the first channel identifier and second channel identifier, the system comprising:

at least one processor;

at least one interface configured or designed to provide a communication link to at least one other network device in the data network; and

memory;

the system being configured or designed to:

communicate between the Head End and the first and second nodes via the first downstream channel;

monitor bandwidth-related information associated with the first and second downstream channels;

perform a load balancing operation which includes transmitting a dynamic channel change request to the first node in order to cause the first node to switch from the first downstream channel to the second downstream channel, wherein the load balancing operation is performed for the purpose of managing bandwidth resources on the first and second downstream channels;

receive, at the first node, a first communication from the Head End, said first communication including a request to perform a dynamic channel change operation, said dynamic channel change (DCC) request including a request to perform a downstream channel change operation;

respond to the dynamic channel change request by implementing the downstream channel change operation at the first node;

communicate between the Head End and the first node via the second downstream channel after successful completion of the downstream channel change operation ; and

communicate between the Head End and the second node via the first downstream channel after successful completion of the downstream channel change operation at the first node.

102. (previously presented) The system of claim 101 being further configured or designed to:

implement the dynamic channel change operation at the first node by switching from the first downstream channel to the second downstream channel to receive communications from the Head End.

103. (previously presented) The system of claim 101 being further configured or designed to:

communicate with the Head End using data received on the first downstream channel prior to performing the dynamic channel change operation.

104. (previously presented) The system of claim 102 being further configured or designed to:

determine whether said second downstream channel is currently being used for receiving communications from the Head End.

105. (previously presented) The system of claim 102 being further configured or designed to:

transmit a dynamic channel change response to the Head End in response to receiving the dynamic channel change request.

106. (previously presented) The system of claim 101, being further configured or designed to:

determine whether data transmitted at the Head End is successfully received on the second downstream channel; and

switch from the second downstream channel to the first downstream channel in response to a determination that data transmitted at the Head End can not be successfully received on the second downstream channel.

107. (previously presented) The system of claim 101 wherein said access network is a wireless network.

108. (previously presented) The system of claim 101 wherein said access network is a cable network, said first node is a cable modem, and wherein said Head End comprises a Cable Modem Termination System (CMTS).

109. (previously presented) The system of claim 101 being further configured or designed to:

receive a request from the Head End to switch from the first upstream channel to a second upstream channel; and

switch to said second upstream channel and said second downstream channel at substantially the same time.

110. (previously presented) The system of claim 109 being further configured or designed to:

switching from the first upstream channel to a second upstream channel to transmit data to the Head End; and

switch from the first downstream channel to the second downstream channel to receive data from the Head End.

111. (previously presented) The system of claim 109 wherein the switching of the upstream and downstream channels results in a switching between a first domain and a second domain of the access network.

112. (previously presented) The system of claim 111 being further configured or designed to:

initiate a domain registration procedure after successfully switching the upstream and downstream channels.

113. (previously presented) The system of claim 112 being further configured or designed to:

initiate a ranging procedure after successfully switching the upstream and downstream channels.

114. (previously presented) The system of claim 109 wherein the first and second downstream channels are not in synchronization.

115. (currently amended) A computer program product for facilitating communications between a network node and a Head End of an access network, the access network including a plurality of nodes which communicate with the Head End via at least one upstream channel and at least one downstream channel, the access network including a first node adapted to communicate with the Head End via at least one downstream channel and at least one upstream channel, the access network further including a second node adapted to communicate with the Head End via at least one downstream channel and at least one upstream channel, the at least one downstream channel including a first downstream channel and a second downstream channel, wherein the first downstream channel is associated with a first channel identifier, and the second downstream channel is associated with a second channel identifier, the at least one upstream channel including a first upstream channel associated with a third channel identifier, wherein the third channel identifier is different from the first channel identifier and second channel identifier, the computer program product comprising:

a computer usable medium having computer readable code embodied therein, the computer readable code comprising:

computer code for communicating between the Head End and the first and second nodes via the first downstream channel;

computer code for monitoring bandwidth-related information associated with the first and second downstream channels;

computer code for performing a load balancing operation which includes transmitting a dynamic channel change request to the first node in order to cause the first node to switch from the first downstream channel to the second downstream channel, wherein the load balancing operation is performed for the purpose of managing bandwidth resources on the first and second downstream channels;

computer code for receiving, at the first node, a first communication from the Head End, said first communication including a request to perform a dynamic channel change operation, said dynamic channel change (DCC) request including a request to perform a downstream channel change operation;

computer code for responding to the dynamic channel change request by implementing the downstream channel change operation at the first node;

computer code for communicating between the Head End and the first node via the second downstream channel after successful completion of the downstream channel change operation ; and

computer code for communicating between the Head End and the second node via the first downstream channel after successful completion of the downstream channel change operation at the first node.

116. (previously presented) The computer program product of claim 115 wherein the computer code for implementing the dynamic channel change operation comprises:

computer code for switching from the first downstream channel to the second downstream channel to receive communications from the Head End.

117. (previously presented) The computer program product of claim 115 further comprising:

computer code for communicating with the Head End using data received on the first downstream channel prior to performing the dynamic channel change operation.

118. (previously presented) The computer program product of claim 116 wherein the computer code for implementing the dynamic channel change operation further comprises:

computer code for determining whether said second downstream channel is currently being used for receiving communications from the Head End.



119. (previously presented) The computer program product of claim 116 further comprising:

computer code for transmitting a dynamic channel change response to the Head End in response to receiving the dynamic channel change request.

120. (previously presented) The computer program product of claim 115 further comprising:

computer code for determining whether data transmitted at the Head End is successfully received on the second downstream channel; and

computer code for switching from the second downstream channel to the first downstream channel in response to a determination that data transmitted at the Head End can not be successfully received on the second downstream channel.

121. (currently amended) A system for facilitating communications between a network node and a Head End of an access network, the access network including a plurality of nodes which communicate with the Head End via at least one upstream channel and at least one downstream channel, the access network including a first node adapted to communicate with the Head End via at least one downstream channel and at least one upstream channel, the access network further including a second node adapted to communicate with the Head End via at least one downstream channel and at least one upstream channel, the at least one downstream channel including a first downstream channel and a second downstream channel, wherein the first downstream channel is associated with a first channel identifier, and the second downstream channel is associated with a second channel identifier, the at least one upstream channel including a first upstream channel associated with a third channel identifier, wherein the third channel identifier is different from the first channel identifier and second channel identifier, the system comprising:

means for communicating between the Head End and the first and second nodes via the first downstream channel;

means for monitoring bandwidth-related information associated with the first and second downstream channels;

means for performing a load balancing operation which includes transmitting a dynamic channel change request to the first node in order to cause the first node to switch from the first downstream channel to the second downstream channel, wherein the load balancing operation is

performed for the purpose of managing bandwidth resources on the first and second downstream channels;

means for receiving, at the first node, a first communication from the Head End, said first communication including a request to perform a dynamic channel change operation, said dynamic channel change (DCC) request including a request to perform a downstream channel change operation;

means for responding to the dynamic channel change request by implementing the downstream channel change operation at the first node;

means for communicating between the Head End and the first node via the second downstream channel after successful completion of the downstream channel change operation ;  
and

means for communicating between the Head End and the second node via the first downstream channel after successful completion of the downstream channel change operation at the first node.

122. (currently amended) A method for facilitating communications between a network node and a Head End of an access network, the access network including a plurality of nodes which communicate with the Head End via at least one upstream channel and at least one downstream channel, the access network including a first node adapted to communicate with the Head End via at least one downstream channel and at least one upstream channel, the access network further including a second node adapted to communicate with the Head End via at least one downstream channel and at least one upstream channel, the at least one downstream channel including a first downstream channel and a second downstream channel, wherein the first downstream channel is associated with a first channel identifier, and the second downstream channel is associated with a second channel identifier, the at least one upstream channel including a first upstream channel associated with a third channel identifier, wherein the third channel identifier is different from the first channel identifier and second channel identifier, the method comprising:

communicating between the Head End and the first and second nodes via the first downstream channel;

monitoring bandwidth-related information associated with the first and second downstream channels;

performing a load balancing operation which includes transmitting a dynamic channel change request, said dynamic channel change request including a request to perform a

downstream channel change operation in order to cause the first node to switch from the first downstream channel to the second downstream channel, wherein the load balancing operation is performed for the purpose of managing bandwidth resources on the first and second downstream channels;

~~transmitting a first request to the first node to perform a dynamic channel change operation, said first request including a request to perform a downstream channel change operation in order to cause the first node to switch from the first downstream channel to the second downstream channel;~~

communicating between the Head End and the first node via the second downstream channel after successful completion of the downstream channel change operation at the first node; and

communicating between the Head End and the second node via the first downstream channel after successful completion of the downstream channel change operation at the first node.

123. (previously presented) The method of claim 122 wherein said access network is a wireless network.

124. (previously presented) The method of claim 122 wherein said access network is a cable network, said plurality of nodes are cable modems, and wherein said Head End comprises a Cable Modem Termination System (CMTS).

125. (cancelled)

126. (cancelled)

127. (currently amended) A system for facilitating communications between a network node and a Head End of an access network, the access network including a plurality of nodes which communicate with the Head End via at least one upstream channel and at least one downstream channel, the access network including a first node adapted to communicate with the Head End via at least one downstream channel and at least one upstream channel, the access network further including a second node adapted to communicate with the Head End via at least one downstream channel and at least one upstream channel, the at least one downstream channel including a first downstream channel and a second downstream channel, wherein the first

downstream channel is associated with a first channel identifier, and the second downstream channel is associated with a second channel identifier, the at least one upstream channel including a first upstream channel associated with a third channel identifier, wherein the third channel identifier is different from the first channel identifier and second channel identifier, the system comprising:

at least one processor;

at least one interface configured or designed to provide a communication link to at least one other network device in the data network; and

memory;

the system being configured or designed to:

communicate between the Head End and the first and second nodes via the first downstream channel;

perform a load balancing operation which includes transmitting a dynamic channel change request, said dynamic channel change request including a request to perform a downstream channel change operation in order to cause the first node to switch from the first downstream channel to the second downstream channel, wherein the load balancing operation is performed for the purpose of managing bandwidth resources on the first and second downstream channels;

~~transmit a first request to the first node to perform a dynamic channel change operation, said first request including a request to perform a downstream channel change operation in order to cause the first node to switch from the first downstream channel to the second downstream channel;~~

communicate between the Head End and the first node via the second downstream channel after successful completion of the downstream channel change operation at the first node; and

communicate between the Head End and the second node via the first downstream channel after successful completion of the downstream channel change operation at the first node.

128. (previously presented) The system of claim 127 wherein said access network is a wireless network.

129. (previously presented) The system of claim 127 wherein said access network is a cable network, said plurality of nodes are cable modems, and wherein said Head End comprises a Cable Modem Termination System (CMTS).

130. (cancelled)

131. (cancelled)

132. (new) The method of claim 84 wherein communication between the Head End and the first and second nodes is implemented using a DOCSIS protocol.

133. (new) The system of claim 101 wherein communication between the Head End and the first and second nodes is implemented using a DOCSIS protocol.

134. (new) The computer program product of claim 115 wherein communication between the Head End and the first and second nodes is implemented using a DOCSIS protocol.

135. (new) The system of claim 121 wherein communication between the Head End and the first and second nodes is implemented using a DOCSIS protocol.

136. (new) The method of claim 122 wherein communication between the Head End and the first and second nodes is implemented using a DOCSIS protocol.

137. (new) The system of claim 127 wherein communication between the Head End and the first and second nodes is implemented using a DOCSIS protocol.

138. (new) The method of claim 84 wherein the downstream channel change is implemented at the first node without rebooting or re-initializing the first node.

139. (new) The system of claim 101 wherein the downstream channel change is implemented at the first node without rebooting or re-initializing the first node.

140. (new) The computer program product of claim 115 wherein the downstream channel change is implemented at the first node without rebooting or re-initializing the first node.

141. (new) The system of claim 121 wherein the downstream channel change is implemented at the first node without rebooting or re-initializing the first node.

142. (new) The method of claim 122 wherein the downstream channel change is implemented at the first node without rebooting or re-initializing the first node.

143. (new) The system of claim 127 wherein the downstream channel change is implemented at the first node without rebooting or re-initializing the first node.